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1. Introduction

Welcome to Climsoft version 4 Data transfer guide. This guide will instruct you on how to import data from different sources into Climsoft. It will also show you how to migrate your data from the earlier versions of climsoft to Climsoft version 4. There are two (2) types of data transfer operations in Climsoft version 4:

1) Internal Data Transfer Operations;
2) External Data Transfer Operations

2. Internal Data Transfer Operations

These operations include the upload of data from data entry forms to observation initial table where the quality control is performed and the transfer of data from the observation initial table to observation final table.

All data-entry forms have got an “Upload” button (green) for transferring data from the key-entry form table to a common table named “observationInitial” where more Quality Control (QC) checks are carried out.

Note: This button is not enabled for a user with the role of operator, but is enabled for users with the role of operator supervisor, QC and administrator (Figure1).

Figure1 - Initiate the Transfer of data from the data entry form to observationInitial via the Upload button
When the **upload** button clicked, it will display the dialog below where the user specify the data for which Stations and the period range (Begin Year, End Year, Begin Month and End Month) of data to be transferred from the selected data entry form to the **observationInitial table**. After selecting the **start** button data transfer process will start immediately and the progress will be displayed at the progress bar.

![Form Data Upload for form_daily2](image)

**Figure 2 - Uploading data from the data entry form to observationInitial via the Start button**

Once data has been successfully transferred into "**observationInitial table**", the quality control is performed and when finished, data will then be transferred to "**observationFinal table**".

**Important**

*It should be noted that only data that would have gone through QC will be uploaded to the **observationFinal** table. Observation records that have not been QC’d will have a QC status zero “0” (qcStatus=0) while records that have been QC’d will have a QC status one “1” (qcStatus=1).*

Follow the steps below to transfer data from **observationInitial table** to **observationFinal table**:

**Step 1:** Login into Climsoft with the role of "Quality control" or "Operator supervisor" or "administrator";

**Step 2:** Click on "**Data transfer**" icon located on the welcome form;

**Step 3:** Click on "**Upload**" then select "**Obs Initial to Final**" (Figure 3);
Step 4: Select “Obs Initial to Final” to open the dialog below (Figure 4) and fill the form with the details of the stations, elements and period range of data you want to transfer (Begin year, End year, Begin Month and End Month) and click on the "Upload" button to start the process of transferring your data to "observationFinal table" (Figure 4) and watch the progress via the data transfer progress bar. By ticking the “Select All Stations” or “Select All Elements”, you instruct the system to transfer data for all the stations and all elements if existing.
3. External Data Transfer Operations

These operations include importing data from CLIMSOFT version 3, CLICOM, Automatic Weather Stations (AWSs) and NOAA GTS.

3.1 Data Migration

During the process of data migration, data from Climsoft version 3 and earlier versions will be successfully imported into Climsoft version 4. This process is carried out as follows:

**Step 1:** Login into Climsoft as "administrator";
**Step 2:** Click on "Data transfer" icon located on the welcome form;
**Step 3:** Click on "External Data" and select "Data Migration" from the drop down list (Figure 5) to obtain the dialog in (Figure 6) below:

![Figure 5 - External Data Transfer Dialog](image)

**Step 4:** The dialog below (Figure 6) is obtained after selecting Data Migration option from the drop down list:

![Figure 6 - Data Migration Transfer](image)
There are 2 options to import data from Climsoft version 3 to Climsoft version 4

3.1.1 Importing from Climsoft V3 MySQL Database

This operation requires that the entire ClimsoftV3 database be available in MySQL script file e.g.: mysql_main.CLIMSOFT_database_v3.sql.

To import such file into Climsoft version 4, follow the steps below:

**Step 1:** Launch MariaDB Prompt from your program "Start Menu", select and click on the "MySQL Client (MariaDB 10.x)" as shown below Figure 7.

![Figure 7 - Launching MariaDB Client](image)

**Step 2:** The dialog for entering the password should then appear as shown in Figure 8 below:
Figure 8 - Entering password on MariaDB Client Prompt

**Step 3:** Type correctly the password for "root". If you have entered the correct password i.e. the same password that you entered during the installation of MariaDB, the prompt should then appear as shown in Figure 9 below:

Figure 9 - MariaDB Prompt after entering a correct password

**Step 4:** Run the script:

Assuming the database script file for creating the Climsoft version3 database in MariaDB database server is in the Path “C:\Backup_Data_SQL”. To run this script, what you need to do is to type the following command:

```
Source C:\Backup_Data_SQL\mysql_main_climsoftT_database_v3.sql
```

as indicated on the above prompt dialog and validate by pressing the "Enter Key" as shown (Figure10) below:
If you have typed the command correctly, the script should run successfully and create the Climsoft V3 database in MariaDB database server. If you wish, you can verify that Climsoft version 3 database has been created successfully by typing the following command on the MariaDB Client Prompt: "Show databases;" and press the "Enter Key".

After creating Climsoft version 3 database in MariaDB database server, the next step is now to migrate data from Climsoft version 3 database to Climsoft version 4 database:

To be able to migrate data from Climsoft version 3 to Climsoft version 4, you have to ensure both database exists in MariaDB database server (i.e.: mysql_main_climsoft_database_v3 and mariadb_climsoft_db_v4). (Figure11);

The data migration from Climsoft version 3 to Climsoft version 4 will then be carried out in the following steps:

**Step1:** Ensure the database names for both V3 and V4 are correctly typed in the right boxes;
Step2: Select the option **Entire Database** if the entire database is to be migrated;

Step3: Select the option **Selected Records** if only a range of data is to be migrated and provide the starting and the ending years appropriately;

Step4: Check the box **Replace Existing Records** if any existing similar records are to be replaced. If Unchecked the duplicate records will be skipped;

Step5: Click **Start** command to start the process;

Step6: Observe any message reported in the message box and address them accordingly.

3.1.2 Importing from Climsoft V3 Backup

Climsoft version 3 backups that are in comma separated values (csv) files are imported through the steps below (Figure12):

**Step1:** Select the option **CLIMSOFT V3 Backup**;

**Step2:** Through the explorer button select the text backup file. The file name is then displayed in the box **Backup File** and wait for the messages; **CLIMSOFT 3 Backup converted to CLIMSOFT 4 Structure**;

**Note:** It is strongly recommended that the computer login user be the Administrator or members of the administrator to perform this task otherwise , this user need to be granted the right permission on the ClimsoftV4 folder and subfolders to be able to perform this task (i.e.: read and write in the ClimsoftV4 folder.

**Step3:** Check or uncheck the box **Replace Existing Records** appropriately;

**Step4:** Click **Start** command to start the process;

**Step5:** Observe any message reported in the messages box and address them accordingly.

![Figure12 - Importing backup csv CLIMSOFT version 3 data into CLIMSOFT version 4](image)
4. Importing CLICOM data

From this operation the 3 CLICOM data formats namely CLICOM Daily, CLICOM Synop and CLICOM Hourly will be imported into Climsoft version 4.

Figure 13 shows a screenshot of sample CLICOM daily data. The data format is similar to that for CLIMBASE. Users with data from CLIMBASE can follow the same procedure to import CLIMBASE data into Climsoft.

To import CLICOM daily data, click on the “Data Transfer” icon on the Climsoft Welcome screen, followed by clicking on the menu items External Data -> CLICOM -> Daily. This will open the dialog shown in Figure 14 below.

Click “Open File” then select the file containing the data and click “Open” on the file open dialog. Enter the hour for the daily data observation in the text box “Default Observation hour” 06Z has been set as the default. Then from the import dialog click “View Data” and the
grid table gets populated with the data. Confirm that it’s the right data then click “Load Data”. Wait for the process shown in Figure 15 to complete with a message “Data import process completed.”

CLICOM Synop and CLICOM Hourly data are similarly imported.

Figure 15 - CLICOM daily data import process

Important:

1. A folder for CLICOM data must be configured under the “General Settings”. This is used as a working area by the Climsoft application during the process of importing CLICOM data. If the MariaDB server is being accessed over the network from a workstation, it would be ideal to map that folder on the workstation for easy access or viewing from the workstation. However, the data to be imported can be placed in any location that is accessible via the “Browse” button.

2. Since most data migrated from CLICOM has been noted to have numerous errors, data from CLICOM will be transferred to the “observationInitial” table so that the data can be QC’d before being transferred to the “observationFinal” table.

Figure 16 - Configuration of CLICOM data folder
5. Importing Automatic Weather Station (AWS) data

Before importing AWS data, it is important to note the structure or format of the AWS data. Many Automatic Weather Stations (AWS) are configured to produce data output files in ASCII format. However, AWS from different suppliers tend to have different observation data outputs depending on the sensors available and configuration of the output. Figure 17 shows a screenshot of sample data from an AWS installed in Rwanda. The first row contains the field column headings representing different meteorological elements. In most cases, not all fields are required for data ingestion into the Climsoft database.

![Figure 17 - Sample observation data from an AWS](image)

5.1 Selecting the import file and viewing data

** Procedures: **

(i) Select the “Data Transfer” icon from the main menu welcome dialog;
(ii) Select “External Data” from the Database utilities menu;
(iii) Select “AWS” to open import dialog as shown in Figure 18;
(iv) Click on “Open File” to browse for the file to import;
(v) After the file has been located, click “Open” in the file open dialog; the filename with its full path will then be shown in the Import File text box. See Figure 18;
(vi) Select the “Delimiter” option that matches the data separator in the selected file, selecting a wrong delimiter option will result in data not being properly imported;
(vii) If some header rows are to be skipped while importing then, enter the row number where importing will start in the “Start Row” text box (Start Row: 2 is the default i.e. data starts at row 2 and row 1 contains the headers for the data columns);
(viii) “Remove Scaling” is checked by default i.e. if the data in the file will be scaled to some decimal points then the decimal point will be removed during the transfer into “observation initial” table. If the data in the file is not scaled to decimal points then the “Remove Scaling” box must be unchecked;
(ix) If all the data belongs to one station and that it does not have a column with station IDs, then type the ID for the station in the “Station ID” text box.

After completing above steps click “View Data” to populate the grid view with the selected data. **Note that** only the first 25 rows of data from the selected file will be listed in the grid table. This is meant to enable confirmation that the right data has been selected. However, the entire file will be imported if everything is well selected.
Note that the column headers in the grid table will be serialized with numbers from 1 up to the last column of that data. The following section outlines how to rename the column headers with the element codes for the data they represent.

Figure 18 - AWS Data Import Dialog

5.2 Configuring column headers and uploading data into Climsoft database

(i) Under “Columns Header Settings” (see Figure 18 above), select the column number and click on the appropriate Field Name from the two boxes therein respectively. Do that for each column until all of them are done. Make sure the correct field names are selected in order for the data to be appropriately mapped in the database. If any column contains data that will not be imported it should be labeled “NA”,

(ii) If the step (i) above is correctly completed then configured header specifications can be saved in a text file to be used later for a similar file without going through that process again. To save the specifications click “Save Header Specs” button and choose a convenient location and file. Note that the file will automatically be allocated file extension of sch e.g. aws1.csh;

(iii) If the header specs had been saved earlier click “Load Header Specs” and select the header specs file. If correctly selected the columns in the displayed data table will be automatically labeled with the header specs.

If satisfied that the columns are correctly named click “Load Data” to start the uploading process. Wait until the busy mouse pointer changes to default. A message will be displaying at the bottom of the dialog in red showing the data transfer progress. It should be noted that the Station IDs and Element Codes used must described in the metadata. If not data described by them will not be imported. Station IDs and Element Codes not found in metadata will be listed at the bottom of the dialog.
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**Important**

1. A folder for AWS data must be configured under the **General Settings**. (Figure 20). This is used as a working area by the Climsoft application during the process of importing AWS data. That folder must be on the computer where the MariaDB is running from. If the MariaDB server is being accessed over the network from a workstation, it would be ideal to map that folder on the workstation for easy access or viewing from the workstation. However, data to be imported can be placed in any location that is accessible via the **Browse** button.

2. Data from AWS will be transferred into the **observationFinal** table.

**Figure 19 - Configuration of column headers**

**Figure 20 - AWS data Configuration**
6. Importing Text Files Data of Different Structures

6.1 Hourly and Daily Data Import

Daily/Hourly data values arranged in one or many columns can be ingested easily into Climsoft version 4. Data should be saved in delimited text files. Figure 21 and 22 are sample data files with data organized in different structures:

Follow the steps below to transfer Hourly/Daily data with one or many columns structure into Climsoft version 4:

(i) Select “Data transfer” icon from the welcome main menu dialog,
(ii) Select “External Data” and select “Text Files” and then “Hourly or Daily” option, Figure 23,
(iii) After selecting “Hourly or Daily” option, the dialog in Figure 60 displays. Click on “Open File” to browse and select the file containing data to transfer, specify the “delimiter” of the file to import (e.g. comma (default), TAB, Others), tick/untick the “remove scaling” box appropriately to ensure data will be imported into “observationinitial” table without the decimal points and then select “View Data” to view the file in data sheet view (tabular form).

(iv) Set the Columns Header by matching each data column by its corresponding field name,

(v) After finishing the matching you will have the dialog shown in Figure 25.
Click the “Load Data” button to load the data into the “observationinitial” table and observe the records uploading count and the process completion message at the bottom of the dialog. In case the upload fails a message will pop up accordingly.

**Note:** To avoid setting the columns headers each time you load new data, save the columns header specifications by selecting the “Save Header Specs” button. Note the file extension (e.g. header1_specs.sch). To retrieve and use the saved columns headers select the “Load Header Specs” button and navigate to select the appropriate file.

### 6.2 Multiple Element Columns

Figure 26 shows a text (csv) file (opened in Excel) with the columns for StationID, Year, Month, Day and 5 columns with values of different Elements (i.e. Tmax, Tmin, RAIN, RAD and EVAP). This file can be easily imported into Climsoft version 4 through the procedure described below:
The procedure to import this file is as follows:

a) Selecting the import file and viewing the data

(i) Select the “Data transfer” icon from the welcome dialog,
(ii) Select “External Data”, then “Text Files” and then the “Multiple Element Columns” option (see Figure27),
(iii) Select Open File to browse the file to import,
(iv) After the file has been located, click Open in the file open dialog; the filename with its full path will be shown in the “Import File box”. See Figure27,
(v) Select the Delimiter option according to the data separator for the selected file (comma, tab or others).
(vi) If some rows are to be skipped while importing e.g. column headers enter the row number where importing will start in the “Start Row” box. Row 2 is the default,
(vii) If the data does not contain the observation hour column, fill the “Default Observation Hour” box by entering the daily observation hour. The value 06 has been set as default as it is the case with most parameters,
(viii) If the data in the file is scaled to some decimal point, then check the box Remove Scaling.
(ix) When all the above steps have been completed click View Data. The table in the dialog is then populated with the data from the selected file. The column header will be serialised with numbers from 1 up to the last column of that data, as shown in Figure27.
b) Configuring column headers and upload data to the Climsoft database

(i) Under “Columns Header Settings”, select the column number and click on the appropriate field name from the two boxes respectively. For the data columns the selected field name should be the element code for the data under that column. Repeat for each column. Make sure the correct field names are selected for the data to be appropriately mapped in the database,

(ii) Once step (i) is completed the created header specifications can be saved in a text file to be used later for a similar file without going through the same process again. To save the header specifications click “Save Header Specs” and choose a convenient location and file,

(iii) If the header specs had earlier been saved in a file then click “Load Header Specs” and select the folder that contains that file. If correctly specified, the columns in the displayed data table are labelled automatically as shown in Figure28,

(iv) Once the columns are correctly named click “Load Data” to start the uploading process. Wait until the busy mouse pointer changes to the default. A message is then displaying at the bottom of the dialog in red showing the data transfer progress.

More details on the Command Buttons for the data import dialog are as follows:

Save Header Specs - Click Save Header Specs to save the header specification as a file for future use;
Load Header Specs - Click on Load header Specs to load the saved header specification into your data to avoid typing the headers each time;
View Data - Click View Data to view the data in a table view;
Load Data - Click Load Data to start the uploading process;
Clear - Click Clear to remove all the data from the table;
Close - Click Close to close the dialog;
Help - Click Help to get more information on the dialog;
6.3 Importing Summarized Data

Data that is summarized on Dekadal or monthly basis can be imported into Climsoft. In practice this is done when the raw data for those summaries is not available. Otherwise it is advisable to import the actual observations because Climsoft is capable of producing those summaries whenever required.

After importing summarized values will be placed in the appropriate day of the month and be allocated a period value that is equivalent to the number of days used in the summary. For instance monthly summary values will be placed on the last day of the month and the period value will be number of days in that month.

Following are examples of the summarized data with layouts:
Figure 29a Dekadal – Multiple Elements columns

Figure 29b Dekadal – Single Elements column

Figure 29c Monthly – Multiple Elements columns

Figure 29d Monthly – Single Elements column

The import procedures will differ with the layout of the summarized data as follows:

a. Data in multiple Elements Columns - Figure 29a and 29c

From Welcome dialog follow:
Data Transfer -> External Data -> Text File -> Multiple Element Columns. Then check option Dekadal or Monthly for type of Figure 29a or 29c respectively.

b. Dekadal data in single Elements Column - Figure 29b

From Welcome dialog follow:
Data Transfer -> External Data -> Text File -> Daily. Then check option Dekadal.

c. Monthly data in single Elements Column - Figure 29d

From Welcome dialog follow:
Data Transfer -> External Data -> Text File -> Monthly.
Notes on Daily Data Import

*Trace Rainfall* – Should be typed as 0T
*Missing Data* – Should be left as blank. Any value that is not numeric will be regarded as missing data
*Cumulated Data* – Cumulated data should be typed with C, e.g. 200C. Values for preceding days be left blanks.

6.4 Upload failures

Data upload may fail due to various reasons. Error messages will be given on each case. As much as possible the messages should be studied carefully and the problems described therein be addressed. In case of station or element in the data that had not been defined in the metadata the affected records will be skipped and the stations/elements listed at the bottom of the import dialog. Data should therefore be corrected and reloaded.

7. Importing GTS data downloaded from NOAA – NCDC FTP site

The NOAA-NCDC FTP site has a huge archive of GTS daily observation data from all synoptic stations around the globe. Most of the data dates back to the early 1970s. The data goes through some QC at NOAA-NCDC and is updated on a daily basis. The data is publicly available in compressed format. Climsoft has a facility for ingesting the unzipped data from NOAA-NCDC. Figure 30 below shows a screenshot of sample data downloaded from the NOAA-NCDC FTP site:

![Figure 30 - Sample data from NOAA-NCDC](image)

To import GTS daily data from NOAA-NCDC;

(i) Select “Data Transfer” icon on the CLIMSOFT Welcome screen,
(ii) Select “External Data” menu;
(iii) 3. Select “NOAA GTS” to open the dialog and browse the data file as shown in Figure 31 below.
Figure 31 - Importing data from a text file downloaded from NOAA-NCDC FTP site

**NOTE:**

(i) A folder for GTS data must be configured under the “**General Settings**”. This is used as a working area by the Climsoft application during the process of importing the GTS data. If the MariaDB server is being accessed over the network from a workstation, it would be ideal to map that folder on the workstation for easy access or viewing from the workstation. However, the data to be imported can be placed in any location that is accessible via the “**Browse**” button.

(ii) Since the GTS data would have gone through QC at NOAA-NCDC, the data is transferred to the “**observationfinal**” table.

Figure 32 - GTS-NOAA data Configuration

**Note:** For any question or further clarifications, contact the CLIMSOFT Helpdesk: support@climsoft.org